Appendix M

Floodplain and Wetland Assessment

1. INTRODUCTION

Pursuant to Executive Order 11988, Floodplain Management, each federal agency is required, when conducting activities in a floodplain, to take actions to reduce the risk of flood damage; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. Pursuant to Executive Order 11990, Protection of Wetlands, each federal agency is to avoid, to the extent practicable, the destruction or modification of wetlands, and to avoid direct or indirect support of new construction in wetlands if a practicable alternative exists. The U.S. Department of Energy (DOE) issued regulations that implement these Executive Orders (10 CFR 1022, Compliance with Floodplain/Wetlands Environmental Review Requirements). In accordance with the terms of this regulation, specifically 10 CFR 1022.11(d), DOE must prepare a floodplain assessment for proposed actions that would take place in floodplains and a wetland assessment for any proposed actions that would take place in wetlands.

This appendix is intended to comply with 10 CFR 1022 and is both the floodplain assessment and the wetlands assessment. A floodplain and wetlands assessment consists of a description of the proposed action, a discussion of its affects on floodplains and wetlands, and a discussion of the proposed alternatives. The discussion of the proposed action also describes the functions and values of floodplains/wetlands and steps taken to minimize impacts on these sensitive natural resources.

1.1 Project Description

Under the Proposed Action, DOE is considering providing federal financial assistance for the construction and demonstration of a 98 megawatt (MWe) power plant and cement-making facility (hereafter referred to as "Co-Production Facility"). Under the proposed federal action, DOE has entered into a 5-year cooperative agreement with Western Greenbrier Co-Gen LLC (WGC) to provide financial assistance through the Clean Coal Power Initiative (CCPI) Program for the development of a Co-Production Facility to be located at Rainelle, Greenbrier County, West Virginia (Figure 1.1).

The DOE goal for this project is to demonstrate a commercially innovative design for an atmospheric pressure, circulating fluidized bed (ACFB) power plant that would generate electricity and steam using coal refuse as fuel and manufacturing a cement product utilizing the resulting ash. A coal-fired rotary kiln coupled with the power plant would combine coal ash, limestone, and other waste materials into a cement material for use in manufacturing structural building products. The ash byproducts would be manufactured at or adjacent to the site of the power plant.

The proposed project includes an environmentally balanced industrial park (EcoPark) situated on and adjacent to the site of the former MRL property on the southern outskirts of the town's city limits. This ''EcoPark'' would use hot water produced from the plant's turbine exhaust to provide heat for buildings. Steam would also be used for various heating and industrial processes, which could include hardwood drying. A 4-million ton coal refuse site in Anjean, WV, and other coal refuse sites in the vicinity of Rainelle, would supply coal refuse fuel for the plant.

Rainelle is a small rural community consisting of residential, commercial, and industrial land and situated along US 60 in western Greenbrier County, West Virginia. The county is rural in character with farms and forest comprising up to 95% of the county's 1,026 square miles (EK, 2003a). Historically, Rainelle supported an active lumber industry that was centered on the

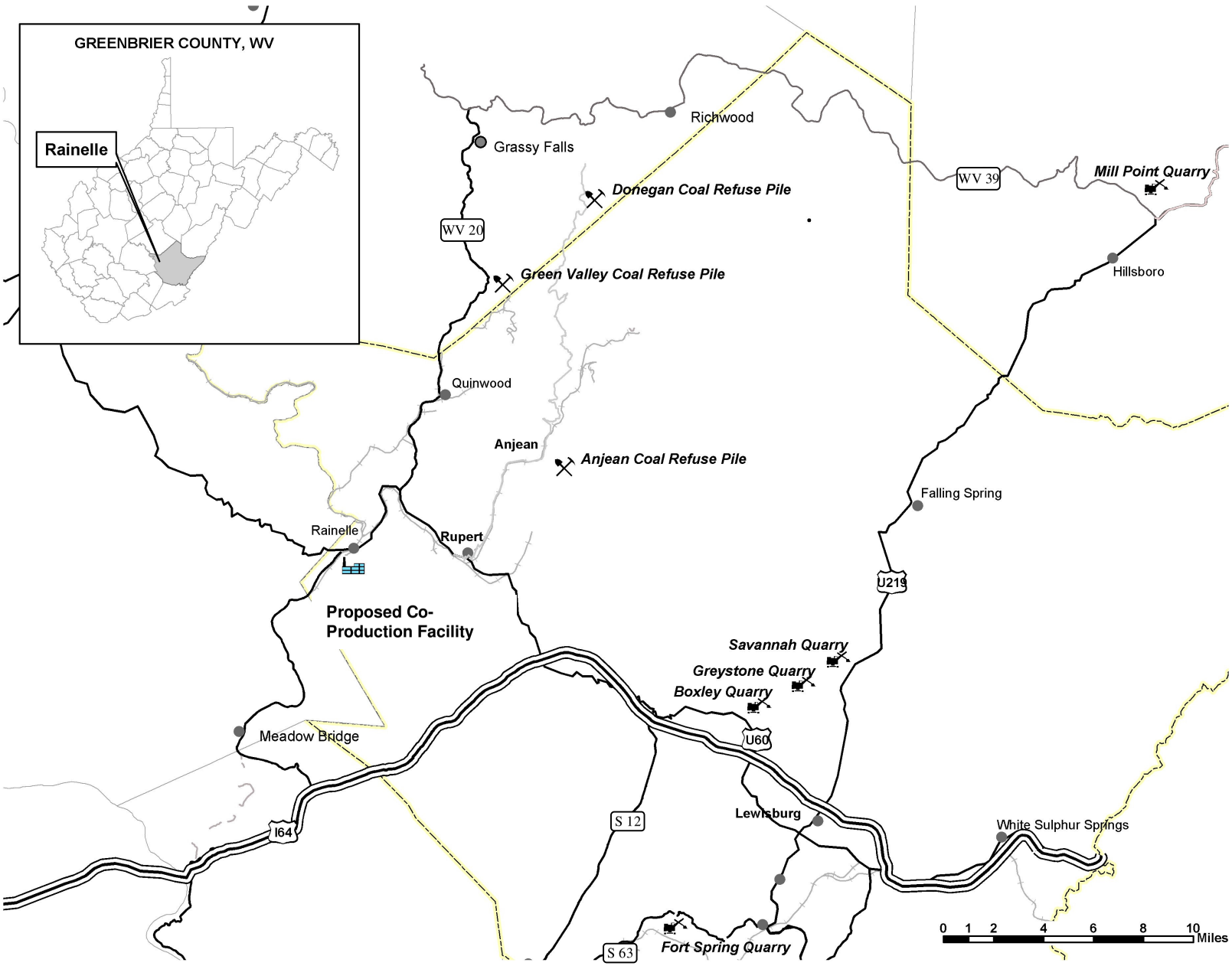

Figure 1.1
General Location

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Meadow River Lumber Company (MRL) (JMA, 2005). Since the closure of the MRL and the opening of Interstate 64, the town has experienced an economic downturn.

Because the project area is situated adjacent to Sewell Creek, wetlands, floodplains, and surface waters could potentially be affected by the proposed action. The severity of potential impacts to wetlands and floodplains would be dependant on the degree and magnitude of the varying design alternatives and associated infrastructures presented by proposed actions. The land is generally flat in the Sewell Creek floodplain from the proposed location of the Co-Production Facility site, northeast to Rainelle's downtown, and north and northwest toward the Rainelle City Hall, Rainelle Medical Center, Rainelle School, and golf course.

Additional information about the Proposed Action can be found in the body of the EIS, which has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and as amended (42 USC 4321 *et seq.*). Chapter 2 of this EIS contains a detailed description of the Proposed Action. Sections 3.5 and 3.7 provide detailed information on the flooplains and wetlands in the area of the Proposed Action. Section 4.5 and 4.7 provide the DOE analysis of potential impacts to floodplains and wetlands that could result from the construction and operation of the proposed power plant.

1.2 Regulatory Requirements

For actions that would be located in a floodplain, DOE is required to describe the nature and extent of the flood hazard. Using the most authoritative information available about site conditions, DOE must determine if a proposed action would be located within either a base action floodplain or a critical action floodplain. The base floodplain is, at a minimum, the area inundated by a flood having a 1.0 percent chance of occurring in any given year (referred to as the 100-year floodplain). The critical-action floodplain is the area inundated by a flood having a 0.2-percent chance of occurring in any given year (referred to as the 500-year floodplain).

Critical action is defined as any activity for which even a slight chance of flooding would be too great. Such actions could include the storage of highly volatile, toxic, or water-reactive materials. DOE does not consider the activities associated with the construction and operation of the proposed power plant as critical actions; therefore, only the 100-year floodplain will be evaluated in this assessment.

Title 10 CFR Part 1022.11 lists four sources of information that must be reviewed to determine whether a proposed action would be located within a floodplain. These sources include the following:

- Flood Insurance Rate Maps or Flood Hazard Boundary Maps prepared by the Federal Emergency Management Agency (FEMA)
- Information from a land-administering agency or from other government agencies with floodplain determination expertise
- Information in safety basis documents as defined in 10 CFR Part 830 (*Nuclear Safety Management*)
- DOE environmental documents.

Title 10 CFR 1022.11 requires DOE to examine the following information to determine whether a proposed action would be located in a wetland, consistent with the most authoritative information available about site conditions:

- U.S. Army Corps of Engineers (USACE), *Wetlands Delineation Manual*
- U.S. Fish and Wildlife Service National Wetlands Inventory
- U.S. Department of Agriculture, Natural Resources Conservation Service Local Identification Maps

- U.S. Geological Survey Topographic Maps
- DOE environmental documents

2. FLOODPLAIN AND WETLAND DESCRIPTIONS

2.1 Floodplains

A floodplain is an area next to a river, stream, or creek that may be covered with water following heavy rainstorms. The floodplain can retain excess water, allowing it to be slowly released into the river system and seep into groundwater aquifers. Vegetation and woody debris in floodplains disrupts surface flow and causes sediment to settle out of floodwaters, thereby keeping it out of water bodies. Floodplains often support important wildlife habitat and are frequently used by humans as recreation areas (VBCCC 2006).

FEMA completed a Flood Insurance Study for Rainelle in 1987. The Flood Insurance Study covered a detailed study of Sewell Creek from the confluence of the Meadow River to the confluence with Little Sewell Creek. A detailed study determines the water-surface elevations on streams and Base Flood Elevations (BFEs) for 10-year, 50-year, 100-year and 500-year flood events. The remaining portion of Sewell Creek and Wolfpen Creek were studied by approximate methods (FEMA, 1987). The approximate method study did not establish BFEs and did not designate floodways.

Floodplains were delineated for Sewell Creek and Little Sewell Creek within the corporate limits of the city of Rainelle as part of the Flood Insurance Study. Topography for the Sewell Creek floodplain is mostly flat north and south of the watercourse. Some variations in topographic elevations occur immediately south of Sewell Creek and the majority of the proposed power plant site facility (E&R site) lies outside the 100-year floodplain. The Flood Insurance Rate Map of Rainelle shows that only a small portion of the project area (approximately 3 acres [1.2 hectares]), is within the 100-year floodplain. This area is shown as Zone A (Figure 2.1).

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplain that is determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses were not performed for such areas, no BFEs or depths are shown around the proposed power plant site. Thus, for this area no floodway has been designated. Generally for projects located in the 100-year floodplain, the local community will require that project owners submit engineering analyses before permits are approved for development in the floodplain. The 100-year flood elevation from the Flood Insurance Rate Map was overlaid on a 1-foot contour topographic map that was developed as part of project efforts to estimate the elevation of the floodplain around the project area. Based on the overlay, the FEMA 100-year flood elevation is approximately 2,398 feet (731meters) at the proposed project site and covers approximately 300 feet (91 meters) above mean sea level (amsl) on either side of Sewell Creek. However, because this estimate only approximates the extent of the 100-year flood elevation, modeling was employed to estimate flood risk at the project site.

Detailed hydraulic modeling of the proposed project site was conducted as part of baseline characterization to determine floodplain boundaries. Stream segments studied include the section of Sewell Creek from the confluence of Wolfpen Creek to US Route 60, Wolfpen Creek from the US Route WV 20 (South Street) bridge to the confluence with Sewell Creek, and an unnamed tributary approximately 2,300 feet (7010 meters) downstream on Sewell Creek from the confluence with Wolfpen Creek.

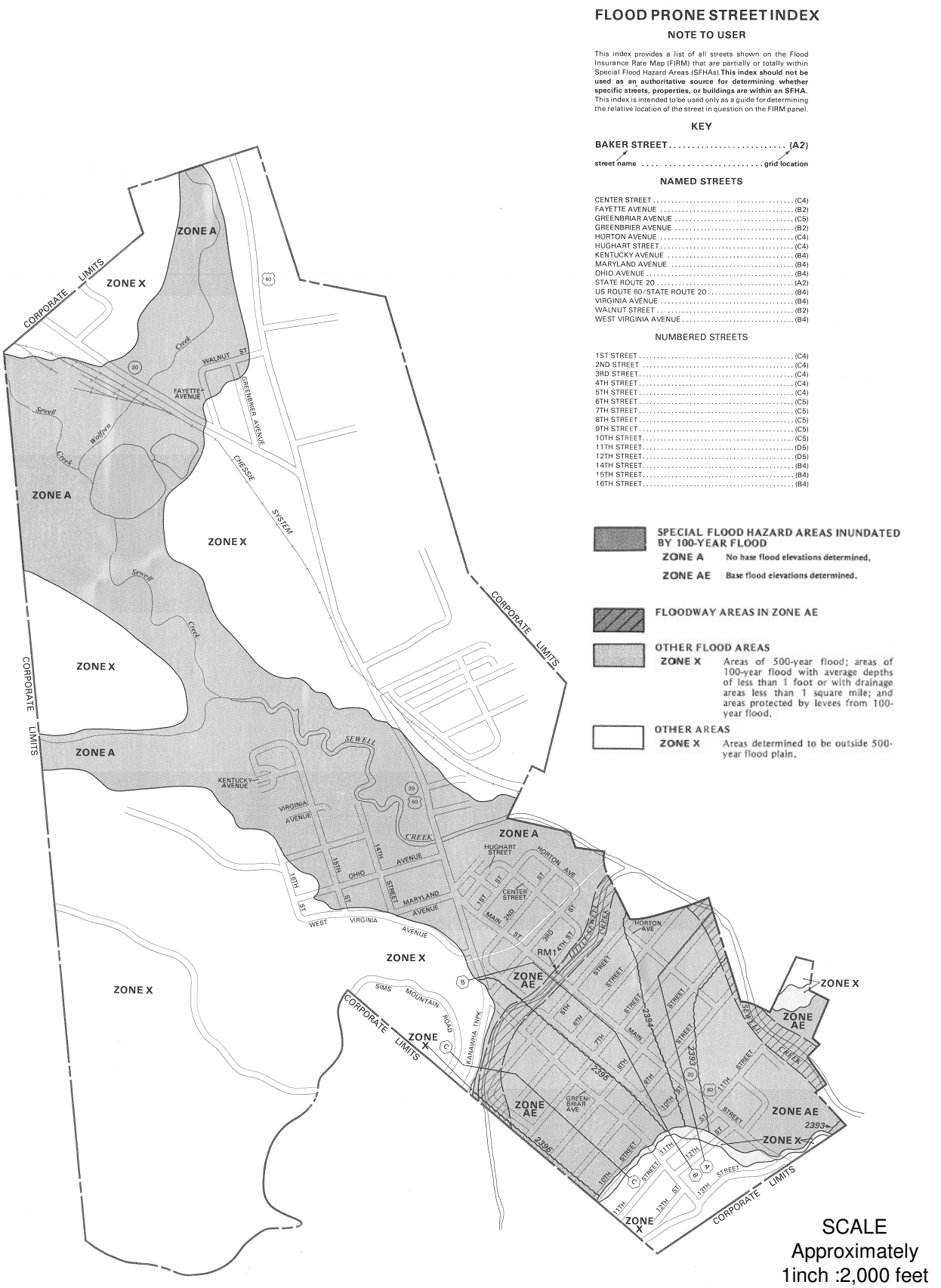

Figure 2.1
Flood Insurance Rate Map (FIRM) of Rainelle

Sources:Federal Emergency Management Agency Community Panel Number 540228 0001 A Effective Date: 19 Nov 1987

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Expected flood flows for 100-year, 100-year + 1 Standard Error Estimate (SEE), and 100-year + 2 SEE storm events were calculated based on techniques presented in U.S Geological Survey (USGS) Open-File report 80-1218, "Runoff Study on Small Drainage Areas in West Virginia." This technique provides a method of estimating the magnitude of peak discharges of 100-year, 100-year + 1SE, 100 year +2SE frequency for unregulated, virtually natural streams in West Virginia. Hydraulic modeling was accomplished using HEC-RAS to estimate base flood elevations for the calculated discharge rates. The 100-year flood elevation was determined to be at an elevation of approximately 2,400 feet and covered a small portion of the Sewell Creek floodplain (Figure 2.2).

2.2 Wetlands

The USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas," as defined in 33 CFR Part 328. Wetlands are important natural resource systems because of the diverse biologic and hydrologic functions they perform. Wetlands provide wildlife habitat, store and release surface waters, and thereby reduce flood damage, retain and bind sediments, and provide ground water discharge or recharge functions. Wetland functions also include water quality improvement, pollution abatement, and nutrient cycling.

Wetlands are protected as a subset of the "waters of the United States" under Section 404 of the CWA. The term "waters of the United States" has a broad meaning and incorporates deepwater aquatic habitats and special aquatic habitats, including wetlands. Jurisdictional "waters" of the United States are areas regulated under the CWA and include coastal and inland waters, lakes, rivers, ponds, streams, intermittent streams, and "other" waters that, if degraded or destroyed, could affect interstate commerce.

Wetlands were delineated using the routine methodology outlined in the 1987 Corps of Engineers Wetlands Delineation Manual. Wetlands typically exhibit three characteristics, which include wetland hydrology, hydrophytic (wetland) vegetation and hydric (wetland) soils. There generally must be a positive indicator of each of these characteristics for a site to be classified as a wetland. Determination of the wetland criteria mentioned above consisted of performing a plant community inventory in which greater than 50 percent of the cumulative cover types (trees, shrubs, vines and herbs) were facultative or wetter, determining the presence of hydric soils, and evaluating the site for evidence of wetland hydrology.

The U.S. Fish and Wildlife Service Cowardin wetland classification characterizes water resources based upon their position within the landscape. Wetlands satisfying the Cowardin classification are identified as Palustrine and Riverine systems.

The majority of water resources wetlands in EcoPark (north of Sewell Creek) and in the Power plant site facility (E&R site) are characterized as palustrine emergent, scrub-shrub and forested wetlands. Wetlands at the EcoPark are vegetated by persistent and nonpersistent herbaceous plants and woody shrubs. Typical members of the aquatic plant community generally consist of:

- cattail (*Typha latifolia*),
- willow (*Salix* sp.),
- swamp dogwood (*Cornus amomum*),
- sedge (*Carex* sp) and
- sensitive fern (*Onoclea sensibilis*).

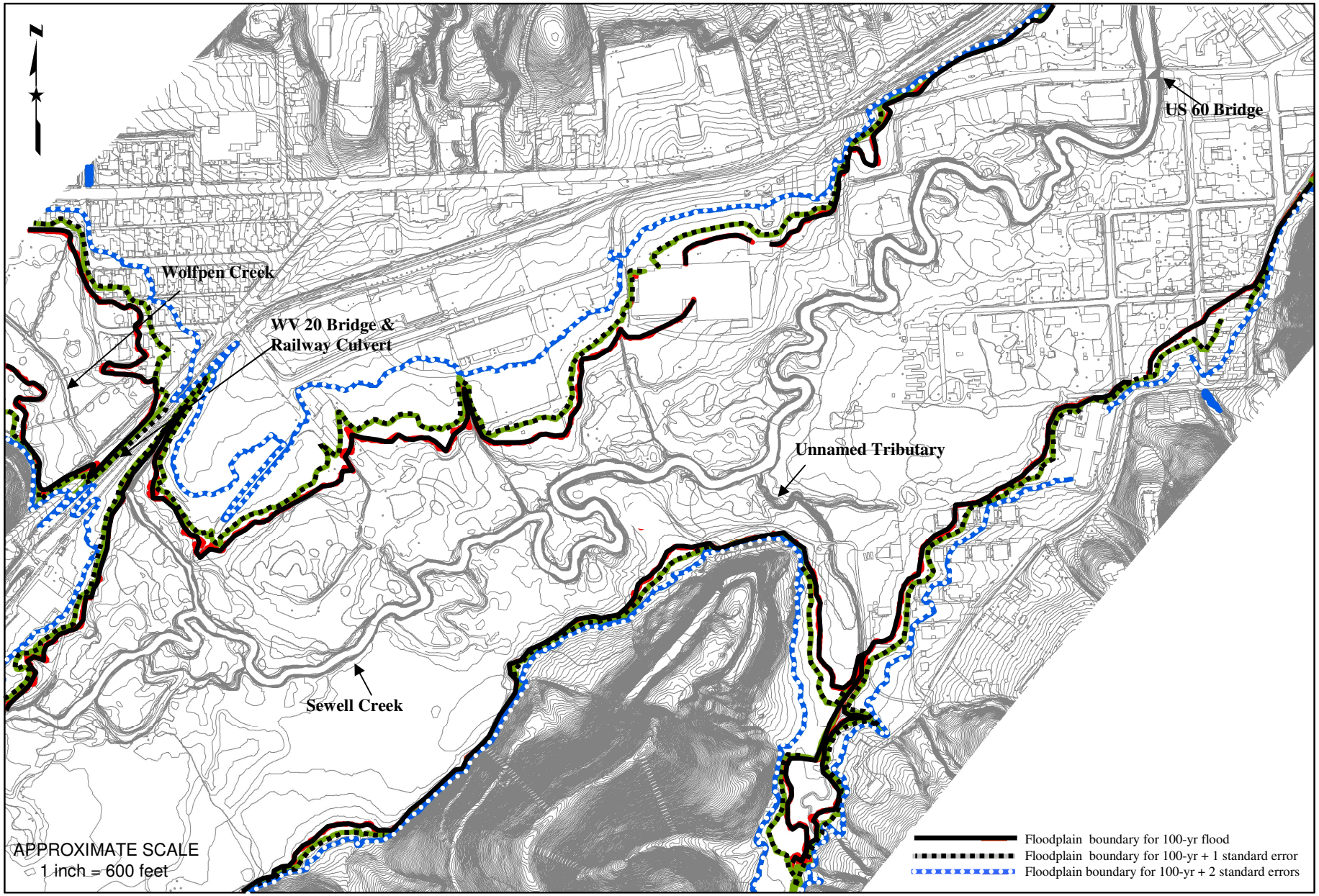

Figure 2.2
Floodplain boundaries for 100-yr, 100-yr + 1SE, and 100-yr + 2SE

Map Source: Potesta, 2004

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Wetlands in the western half of the power plant site are emergent and forested. Wetland hydrology in the forested wetlands was characterized by braided drainage channels. The dominant species observed in the wooded wetland are:

- red maple (*Acer rubrum*),
- pin oak (*Quercus palustris*),
- spicebush (*Lindera benzoin*),
- swamp dogwood (*Cornus amomum*),
- cinnamon fern (*Osmunda cinnamomea*),
- jewelweed (*Impatien*s sp.),
- sensitive fern, and
- skunk cabbage (*Symplocarpus foetidus*).

The wooded upland areas are dominated by:

- red maple,
- American beech (*Fagus grandifolia*),
- red oak (*Quercus rubra*),
- hawthorne (*Cretagus* sp.),
- ironwood (*Carpinus caroliniana*),
- Christmas fern (*Polystichum acrostichoides*),
- witch hazel (*Hamamelis virginiana*) and
- Virginia creeper (*Parthenocissus quinquefolia*).

The riverine system includes water resources within a stream channel that is characterized as "an open conduit either naturally or artificially created which periodically or continuously conveys water, or which forms a connecting link between two bodies of standing water" (Cowardin et al. 1979). Upland islands or palustrine wetlands may occur in the channel. Based upon the result of the field investigations, Sewell Creek, Wolfpen and intermittent tributaries meet the definitions of Riverine Systems. Figure 2.3 shows the extent of wetlands in the project area.

3. FLOODPLAIN AND WETLAND IMPACTS

In accordance with 10 CFR 1022.12(a)(2), a floodplain and wetland assessment must discuss the positive and negative; direct and indirect; long- and short-term effects of the Proposed Action on the floodplain and/or wetlands. In addition, the effects on lives and property, and on natural and beneficial values of floodplains, must be evaluated. For actions taken in wetlands, the assessment should evaluate the effects of the Proposed Action on the survival, quality, and natural and beneficial values of the wetlands. If DOE could find no practicable alternative to constructing in floodplains or wetlands, DOE would design or modify its actions to minimize potential harm to floodplains and wetlands. This section provides a discussion of the potential impacts of the Proposed Action and alternatives, including impacts that would be associated with each alternative.

Figure 2.3
Jurisdictional Wetlands Boundaries

Source: Potomac-Hudson Engineering

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In accordance with 10 CFR 1022.13(a)(3), DOE must also consider alternatives to the Proposed Action that would avoid adverse impacts and incompatible development in the floodplain or wetland, including alternative sites, alternative actions, and no action. Further, DOE must evaluate measures that mitigate the adverse impacts of actions in a floodplain or wetland including, but not limited to, minimum grading requirements, runoff controls, design and construction constraints, and protection of ecologically sensitive areas. Alternative are discussed in this section along with impacts associated with each alternative.

Portions of the proposed site for the Co-Production Facility fall within the 100-year floodplain (Zone A). Flood hazard boundaries have been mapped, but FEMA has not defined floodway boundaries for the project area. Part 65 of the National Flood Insurance Program (NFIP) (44 CFR Part 65, Identification and Mapping of Special Flood Hazard Areas) requires that until a floodway is developed for a mapped stream, substantial development or new construction is not allowed in the floodplain unless it is demonstrated that the cumulative effect of the development will not result in increases in the water surface elevation above the designated height along any segment of the water course. Local communities generally require that project owners submit engineering analyses before permits are approved for development in the floodplain.

Since each of the proposed alternatives includes development within floodplains and wetlands, they would be subject to the NFIP requirements. Both the power island and the ash byproduct facility would be graded so that the base elevations of these sites are above the 100-year floodplain elevation. Therefore, permanent losses of floodplain areas would occur as a result of the Proposed Action and would include a potential loss of flood storage volume. The amount of floodplain lost in terms of square feet is listed in the sections below.

3.1 3.1 No Action Alternative

Under the No Action alternative, DOE would not provide financial assistance for the Co-Production facility. Although WGC could proceed to implement the proposed project in spite of the lack of funding, it is unlikely that this project would be completed successfully without DOE funding support. As a result, no development would occur in floodplains or wetlands and there would be no impact or change in baseline conditions relating to the potential for future flooding.

3.2 Facility Footprint - Alternative A

The Co-Production facility property on the south side of Sewell Creek was selected by the project developer as the preferred alternative, based upon a number of considerations, including the availability of adequate site acreage; limited disturbance of wetlands and floodplains; and concerns about economic, community, and surrounding land uses. Alternative A (see Figure 3.1) would disturb an estimated 16 acres (6.5 hectares) of floodplains. Vegetated water resources (wetlands) potentially disturbed by the Proposed Action total 0.23 acres (930 square meters).

Emergent wetlands; other waters of the United States (Sewell Creek and an unnamed tributary); forested wetlands and a vegetated ditch would be impacted by the proposed development activities. Cumulatively, the water resources provide sediment stabilization and water quality functions. However, when viewed from a watershed context, the wetlands to be impacted provide relatively low magnitude functions when compared to undisturbed wetlands occurring within the watershed because they have been altered by past human activities. These activities consist of ground disturbance, and stream channel realignments, and therefore possess a lower functional capacity. Potential impacts to wetlands and other waters related to Option A are listed below and summarized by Co-Production Facility component in Table 1.

Leveling of the previously cleared northeastern end of the ridge connected with Sims Mountain could accommodate the facility. The site grade would be raised from the existing base

elevation of approximately 2,400 feet to approximately 2,420 feet above mean sea level, and thereby provide buildable land without extensive encroachment into the 100-year floodplain (Figure 3.1).

Table 1: Wetland Areas/Waters of the U.S. Affected by Facility Footprint - Option A

Facility Component or Feature	Approximate Area in Acres	Approximate Area in Hectares
Ditch crossing	0.03	0.01
Power Plant	0.10	0.04
Stream Crossing	0.03	0.01
West of permanent bridge	0.01	0.004
Tributary Impact	0.02	0.01
Temporary Road	0.01	0.004
Water Supply Line	0.03	0.01
Total Area	**0.23**	**0.09**

Generally, to comply with NFIP requirements, communities prohibit development in the floodway, which is defined by FEMA as "…*the channel of a river or other water course and the adjacent areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation by more than the designated height*." The designated height set by FEMA is a surcharge value of 1.0 foot (0.30 meters) for the 1 percent annual chance flood (i.e., the 100-year recurrence interval flood). In areas where floodway boundaries have not been established by FEMA, it is incumbent upon the community to ensure that development within the floodplain complies with the NFIP requirements. Although a minimal amount of floodplain area would be affected by the proposed project, none of the siting options identified would result in changes in surface water elevations that would exceed the FEMA designated height of one foot for the 100-year flood event. Wetlands not disturbed by the activities would continue to perform water quality functions such as sediment retention and stabilization, nutrient transformation, and flood flow attenuation. An unnamed intermittent stream is located east and north of the proposed power plant site. A portion of this intermittent stream would be affected by construction of an emergency access road entering the site facility in the southeast quadrant of the project area. Consequently, approximately 100 linear feet of the intermittent stream would be affected by the proposed placement of a culvert. It is expected that the culvert design would allow sufficient water to pass though the culvert without creating significant back water flooding or other adverse environmental impacts.

The land bordering the intermittent stream is currently characterized as a mowed grassy upland field. Therefore, the area affected by the Proposed Action provides low magnitude wildlife habitat, flood attenuation and water quality functions. Disturbed areas would be restored to their original grade, where feasible, and planted with native vegetation. Areas not altered by the construction of the access road would continue to serve wildlife habitat and sediment stabilization functions. Best management practices would be implemented to minimize adverse environmental impacts during construction of the road crossing. The intermittent stream (Wolfpen Creek) situated upstream from the power plant would not be affected by the Proposed Action.

Figure 3.1 Site Layout – Alternative A

3.3 Facility Footprint - Alternative B

This alternative would potentially encroach into significant wetland and floodplain areas. In addition, Alternative B would also involve the encroachment and fill of a meander bend of Sewell Creek (Figure 3.2). In addition to encroachment into waters of the US, a small portion of Sewell Creek would be straightened, which would affect the physical characteristics of Sewell Creek downstream from the project area, and may result in increased stream velocities locally. The project would result in the loss of riparian wetlands and their ability to filter sediments, resulting in a decrease in water quality and wildlife habitat. An estimated 20 acres of floodplains would be affected under this alternative. Alternative B also includes the relocation of the unnamed tributary, which would result in a more substantial change in local hydrology.

The relocation of the intermittent stream east of the power plant site would result in minor temporary impacts to water quality during construction. Small amounts of sediment could be discharged and transported down stream into Sewell Creek, resulting in a short-term increase in turbidity. The riparian zone of the intermittent stream would temporary loose its ability to retain and stabilize sediments, and its ability to export detritus would be temporarily compromised. Impacts to the intermittent stream and Sewell Creek could be further minimized by constructing the stream realignment during the dry season. Best management practices would be implemented during the construction, and the disturbed areas would be restored to its original grade, were feasible, and planted with native vegetation common to the region of influence. Wolfpen Creek would not be adversely affected by the Proposed Action.

3.4 Facility Footprint - Alternative C

This alternative includes providing rail access to the site and to the coal refuse sites, but would not be economically feasible. The cost associated with infrastructure upgrades, including rail spurs at the site and coal refuse piles, and upgrade requirements for unused sections of the rail line, was a key consideration when evaluating the rail option. The ability of the site layout to accommodate a rail line was also a key factor, as were the material handling requirements at both the plant and coal refuse sites. In addition to increased costs, 18 acres of floodplain and wetlands would be affected under this alternative (Figure 3.3).

Like Alternative A, the unnamed intermittent stream east of the proposed power plant site would be affected by construction of an emergency access road entering the site facility in the southeast quadrant of the project area. Approximately 100 linear feet of intermittent streambed would be affected by the placement of the culvert. It is expected that the culvert design would allow sufficient water to pass though the culvert without creating significant back water flooding or other adverse environmental impacts. The land bordering the intermittent stream is currently characterized as a mowed grassy upland field and provides low magnitude wildlife habitat, flood attenuation and water quality functions. Potentially disturbed areas would be restored to their original grade, where feasible, and planted with native vegetation. Best management practices would be implemented to minimize adverse environmental during construction of the road crossing. The intermittent stream (Wolfpen Creek) situated upstream from the power plant would not be adversely affected by the Proposed Action.

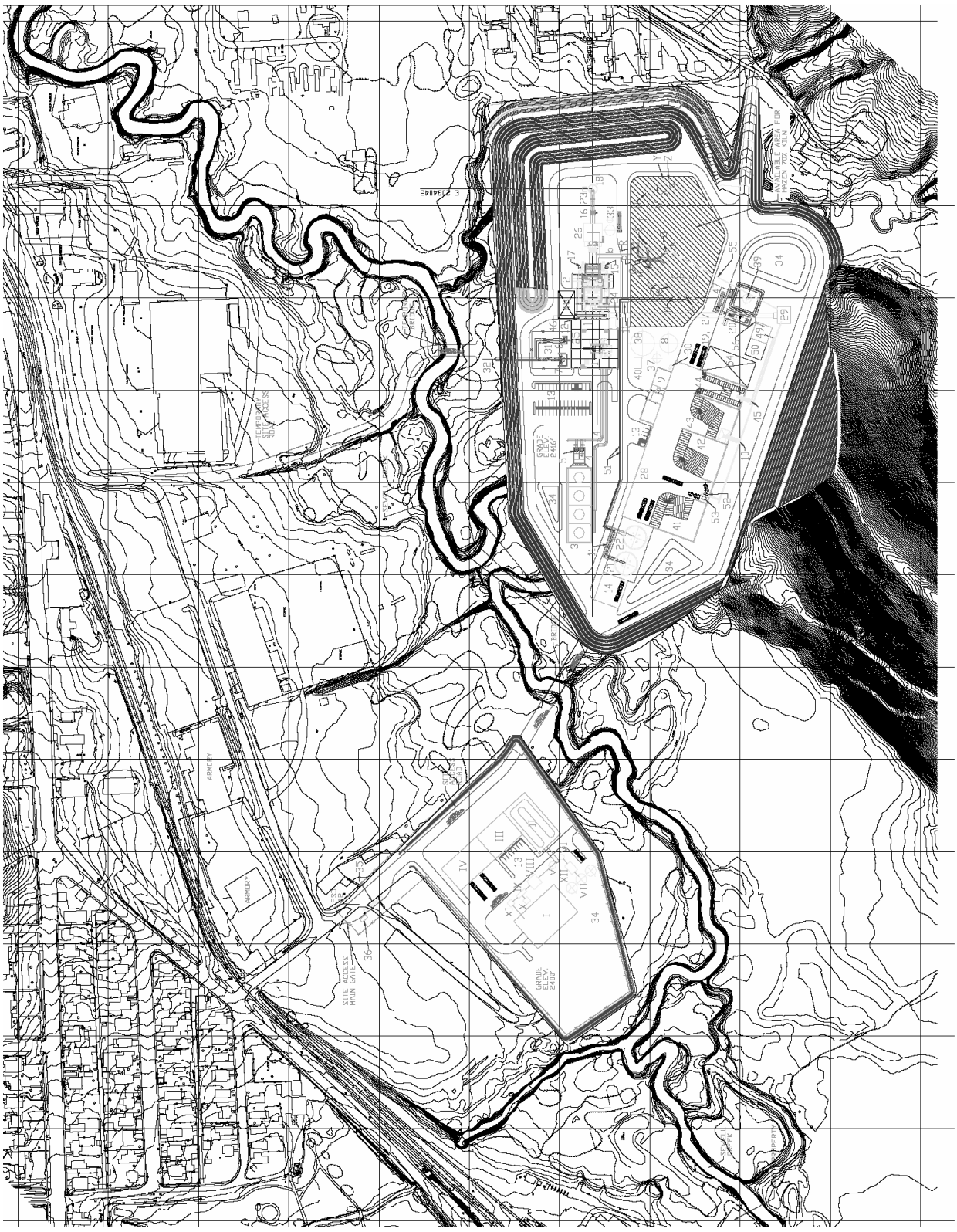

Figure 3.2 Site Layout – Alternative B

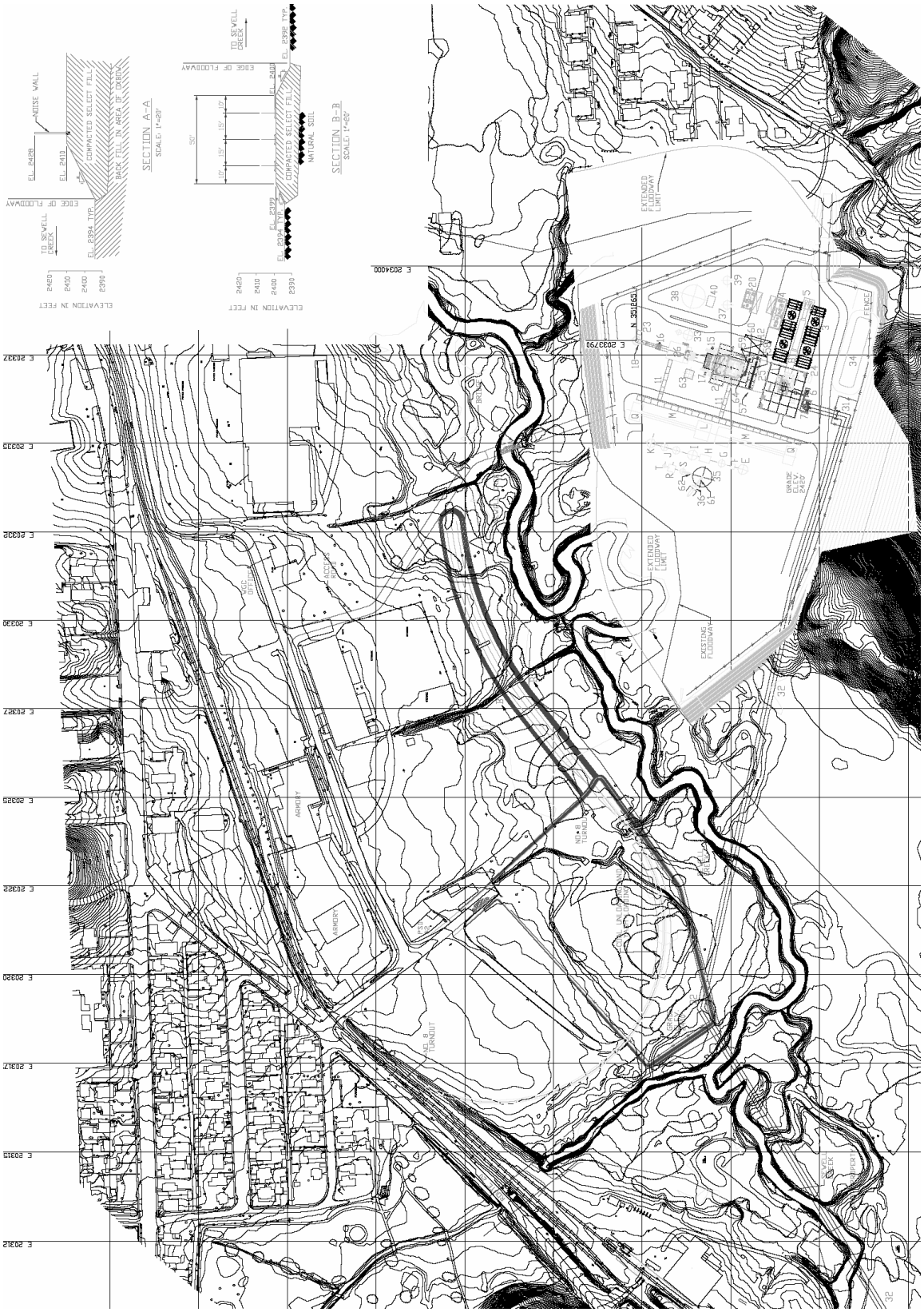

Figure 3.3 Site Layout – Alternative C

3.5 Temporary Bridge

A temporary bridge would be constructed for access to the E&R Property during construction and would remain in place until the permanent DOH bridge is operational. The temporary bridge would be located upstream of the confluence of Sewell Creek and the unnamed tributary. Temporary changes in local hydrology around the temporary bridge site could occur while the bridge is in place. However, these changes would be limited to backwater effects caused by the bridge during storm events that could cause Sewell Creek over flow its banks. In such instances, backwater to the height of the temporary bridge top could occur, at which point surcharges would flow over the bridge. Areas that could potentially be affected by this backwater are limited to lower, undeveloped areas in the EcoPark and on the E&R Property that are immediately upstream of the temporary bridge. These impacts would be considered minor because the temporary bridge would be close to the existing site grade and would be overtopped during flood events. Wolfpen Creek would not be adversely affected by the Proposed Action.

4. MITIGATION MEASURES

In accordance with 10 CFR 1022.12(a)(3), DOE must address measures to mitigate the adverse impacts of actions in a floodplain or wetlands, including but not limited to, minimum grading requirements, runoff controls, design and construction constraints, and protection of ecologically sensitive areas. Whenever possible, DOE would avoid disturbing floodplains and wetlands and would minimize impacts to the extent practicable, if avoidance was not possible. This section discusses the floodplain and wetland mitigation measures considered in the vicinity of the proposed power plant site and, where necessary and feasible, implemented during construction, operation, and maintenance of the facility. In general, impacts to floodplains and wetlands would be minimized through the implementation of engineering design standards and best management practices.

The majority of wetland impacts at the site would occur during construction and development. Once the facilities begin operation, few additional impacts would occur. The bridge over Sewell Creek and all culverts would be inspected routinely and maintained to avoid potential future impacts on water resources.

All storm water at the plant site would be collected and transported to an onsite retention basin for reuse by the facility as process water. Storm water would be discharged to Sewell Creek only when the capacity of the detention basin would be exceeded (see Section 4.4, Surface Water Resources). The loss of natural runoff from the project area to the wetlands along Sewell Creek is not anticipated to have a significant impact.

4.1 Engineering Design Standards

Adverse impacts to the affected floodplains would be minor. Even during 100-year or greater flood event, it is unlikely that differences in the rate and distribution of erosion and sedimentation caused by construction of a power plant would be measurably different compared to existing conditions. However, DOE would still minimize disturbance of surface areas and vegetation and would maintain natural contours to the maximum extent feasible. DOE would stabilize slopes to minimize erosion and would avoid unnecessary off-road vehicle travel.

Although floodplain areas would be filled, based on the predictive modeling that was conducted using HEC-RAS, none of the siting options would result in changes in surface water elevations that would exceed the FEMA designated height of 1 foot (0.3 meters) for the 100-year event.

4.2 Best Management Practices

A National Pollutant Discharge Elimination System General Construction Permit would be required for construction activities. In accordance with this permit, construction contractors would be required to prepare and submit a Storm Water Pollution Prevention Plan. The Storm Water Pollution Prevention Plan would be consistent with State of West Virginia and federal construction activity standards, and would detail the best management practices to minimize soil loss and degradation to nearby water resources. Table G-6 lists many of the categories of best management practices that would be considered for the construction and operation of the proposed power plant.

Table 4.1. Best Management Practices (BMPs) (page 1 of 2).

Management Practice	Description
Road and Construction Site Practices	
Development Site Plan	A site plan identifies the physical features of the site, the location of proposed development, and the location of temporary and/or permanent BMPs. By utilizing a development site plan the proposed development can be situated to minimize impact to natural resources and the land, and to enable water quality protection measures and runoff conveyance measures to be properly located.
Grading Seasons and Practices	The grading season is determined by the local climate conditions. All grading, clearing, and excavation work should be conducted during this period to avoid climatic conditions that could increase the chances for erosion. Grading and construction activities should be coordinated such that bare and disturbed soil exposure is minimized during the winter snow and rainy seasons.
Erosion and Sediment Controls	
Erosion & Sediment Control Structures	Properly designed, installed, and maintained, erosion and sediment control structures will effectively reduce the transport of sediments, minimize erosion and the degradation of water resources and reduce negative impacts to natural resources (i.e., vegetation, wildlife).
Runoff Interceptor Trench or Swale	Properly designed, installed, and maintained, a runoff interceptor trench or swale will effectively convey surface runoff, minimize soil erosion resulting from surface runoff and reduce the degradation of receiving water resources.
Siltation or Filter Berms	Siltation or filter berms capture and retain runoff from construction sites and allow sediments to settle out, and direct runoff water through filter berms at outlets to stabilized drainage ways.
Filter or Silt Fence	Filter or silt fences are constructed to intercept and capture sediment by decreasing the velocity of surface runoff.
Sediment Basins	Sediment basins are effective in reducing water pollution by to trapping sediment originating from construction sites by providing basins for deposition and storage of silt, sand, gravel, stone, and other debris.

Table 4.1. Best Management Practices (BMPs) (page 2 of 2).

Management Practice	Description
Slope Stabilization Practices	
Slope Shaping	Slope shaping is comprised of designing and modifying cut or fill slopes to reduce the soil erosion and runoff potential. Activities include pre-disturbance planning and design, terraces, benches, serrations, and steps.
Retaining Structures	Retaining structures are walls comprised of wood, rock, concrete or other material, constructed at the toe of a slope in order to protect the slope face or toe from scour and erosion from storm runoff.
Rock Riprap	Rock riprap is a layer of loose rock placed over an erodible soil or surface disturbance in order to protect the soil surface, to provide for slope stabilization on steep slopes, and to reduce soil erosion within a project area.
Watershed Management	
Stream Protection & Stabilization	Stabilization of stream channels and stream banks is an effective treatment to reduce sediment loading, and control erosion and land damage.
Floodwater Retarding Structure	Floodwater retarding structures are installed to reduce flood damages downstream by controlling the release rate from flood flows of predetermined frequencies.
Floodwater Diversion	Floodwater diversions will protect the land, surface Improvements, and the watershed by reducing erosion and sediment delivery to receiving waters.
Urban Resource Management	
Street Runoff Collection	Street runoff collection prevents erosion of roadside shoulders and adjacent roadway slopes from surface runoff.
Storm Drainage Structures	Storm drainage structures include pipes, channels, drop inlets, slotted drains, grease and oil traps, or other facilities used to collect and/or convey surface runoff. Their effectiveness depends on keeping them free from debris or filled with sediment.
Landscaping	Proper landscaping can stabilize disturbed sites in a manner that controls surface drainage and soil erosion.

Best management practices are structural and nonstructural controls used to manage nonpoint source pollution such as sedimentation and storm-water runoff. Structural controls are best management practices that need to be constructed (e.g., detention or retention basins). Non-structural controls refer to best management practices that typically do not require construction, such as planning, education, revegetation, or other similar measures. Sedimentation and storm-water runoff are typically addressed through the use of temporary and permanent best management practices. These include techniques such as grading that would induce positive drainage, and installation of silt fences and revegetation to minimize or prevent soil exposed during construction from becoming sediment to be carried offsite. Best management practices would be implemented, inspected, and maintained to minimize potential for adverse affects to downstream water quality. Therefore, impacts from erosion and sediment runoff associated with construction efforts to be minor.

During large flood events, when water is held on the upstream side of the structure, it is possible that sediment could accumulate on the upstream side of the crossings. Areas upstream of water crossings would be maintained free of alluvial material so that the flood storage volume of the stream would have the capacity to accommodate floods, and avoid overflow during flood events. Sediment removed from these areas would be removed by truck and disposed of appropriately or, depending on the location of the drainage channel, simply moved out of the drainage channel and left on-site. Under normal conditions alluvial sediments would be conveyed downstream and been deposited where floodwaters disperse. Compared to the total amount of sediment that is moved by floodwaters along a stream reach, the amount deposited behind a crossing would be minor. In addition, sediments deposited during the cycle of seasonal flooding provides nutrient to vegetation and habitat for vertebrate and invertebrate wildlife.

Storage of hazardous materials during the construction and operations periods would be in accordance with normal environmental regulatory requirements (e.g., within secondary containment) and best management practices. As practicable, hazardous materials would be stored outside of floodplains. Hazardous materials that would be most susceptible to accidental spills and releases would be the fuels and other petroleum products that would be required to support power and equipment needs for the construction and operation of the proposed rail line.

4.3 Regulatory Mitigation

Wetlands adjacent to jurisdictional waters are also considered jurisdictional waters and would require mitigation for their loss. The required mitigation would be determined by the appropriate state and federal agencies. This might involve construction of replacement wetlands, or the acquisition and placement of existing wetlands in a perpetual conservation easement. The ratios of impacted wetlands to wetlands placed in a conservation easement would also be determined by the state and federal regulatory agencies.

4.4 Storm Water Discharge

Sediment is the primary pollutant generated at construction sites. Runoff from construction and industrial activities has the potential to generate large quantities of sediment and other contaminants if not properly addressed. In response to this common cause of water-quality impairment, the Environmental Protection Agency promulgated regulations requiring the permitting of storm-water-generated pollution under the National Pollutant Discharge Elimination System (Section 402 of the Clean Water Act). The West Virginia Department of Environmental Protection has been delegated the authority to administer these federal regulations and has adopted state regulations to administer a National Pollutant Discharge Elimination System Stormwater program. A National Pollutant Discharge Elimination System General Construction Permit would be required for construction activities associated with the Proposed Action or Shared-Use Alternative. In accordance with the National Pollutant Discharge Elimination System, DOE must do the following:

- Prepare a Storm Water Pollution Prevent Plan or plans to address construction of the proposed power plant, including (but not limited to) gob pile sites, transmission corridors, and pipelines.
- Obtain storm water National Pollutant Discharge Elimination System permit(s).
- As part of the National Pollutant Discharge Elimination System permit application, identify proposed measures, including best management practices, to control pollutants in storm-water discharges during and after construction, such as diversion, detention, erosion control,

sediment traps, gravel construction entrances, covered storage, spill response, and good housekeeping.

WGC intends to reuse virtually all of the storm water runoff collected onsite. Storm water would be discharged to Sewell Creek only when the capacity of the retention basin would be exceeded. Because the majority of the runoff volume from the proposed plant site would be collected, treated, and reused, the amount and quality of the runoff as a result of the project would not significantly impact the aquatic ecosystem of Wolfpen and Sewell Creek (see Section 4.4.3).

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